4.1 Modeling Projects

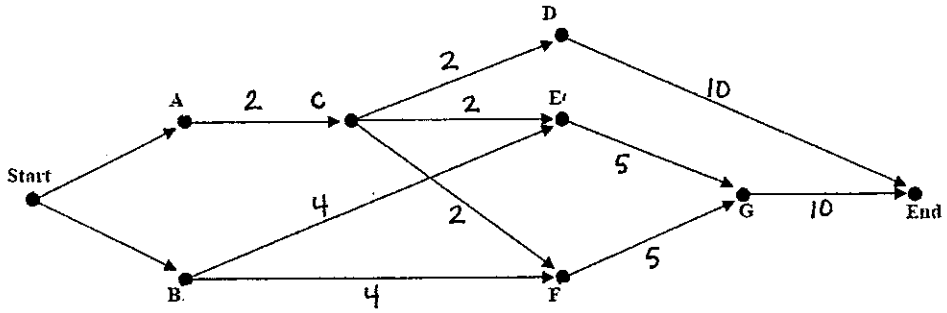
1. Use the task table to draw a graph with appropriately labeled vertices and edges.

Task	*Time*	*Tasks that must be completed prior to starting this task*
Q	2	
A	3	Q, X
X	4	Q
F	5	X

2. Use the task table to draw a graph with appropriately labeled vertices and edges.

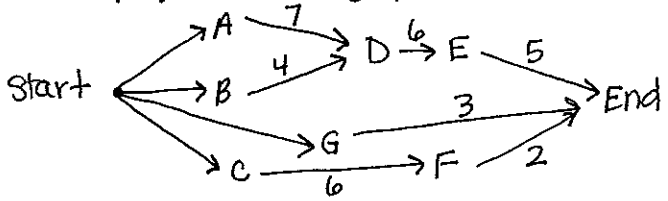
Task	*Time*	*Tasks that must be completed prior to starting this task*
A	5	C
B	5	C, D
C	5	
D	2	G
E	15	A, B
F	6	D
G	2	
H	2	G

3. Consider the project whose digraph is shown below, fill in the task table.



Task	*Time*	*Tasks that must be completed prior to starting this task*
A		
B		
C		
D		
E		
F		
G		

4. Consider the project whose digraph is shown below, fill in the task table.



Task	*Time*	*Tasks that must be completed prior to starting this task*
A		
B		
C		
D		
E		
F		
G		

For the following task tables, (a) Draw a digraph to represent the situation, (b) Find the shortest start time for each task, and (c) Identify the critical path.

1.

Task	Preceded by	Elapsed time in minutes
A: weigh ingredients		1
B: mix ingredients	A	3
C: dough rising time	B	60
D: prepare tins		1
E: preheat ovens		10
F: knock back dough and place in tins	C, D	2
G: dough rising time in tins	F	15
H: cooking time	E, G	40

2.

Task	Preceded by	Duration (minutes)
A: get up		30
B: make tea	D, E	3
C: fill kettle	A	1
D: fetch milk	A	1
E: boil water	C	4
F: pour milk on cereal	D	1
G: make toast	H	4
H: cut bread	A	2
I: eatl	B, F, G	10

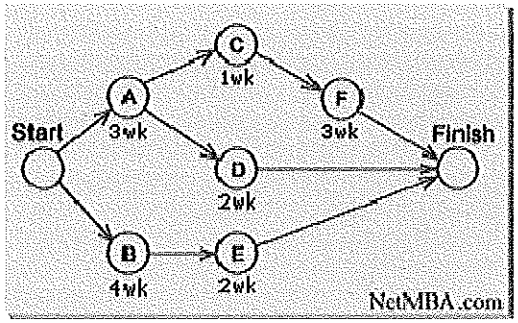
3.

Task	Time (hours)	Preceding Activities
A: remove old furniture	1	
B: remove carpet	½	A
C: take down curtains and rail	½	
D: remove wallpaper	2	B, C
E: prepare walls	½	D
F: prepare woodwork	1 ½	D
G: paint walls and ceiling (first coat)	5	E
H: paint woodwork	8	F
I: paint walls and ceiling (second coat)	5	G
J: lay new carpet	2	H, I
K: put up curtain rail and hang curtains	1	H, I
L: arrange new furniture	1	J
M: hang pictures	½	I

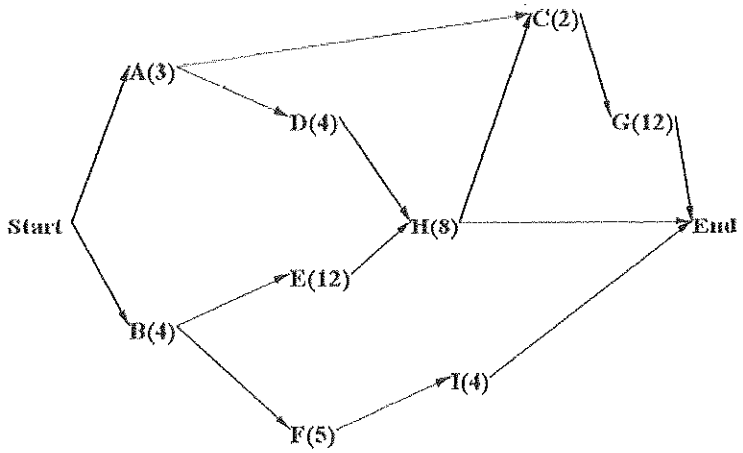
Review – 4.1 & 4.2

For the following digraphs, (a) Write a task table to represent the situation, (b) Find the shortest start time for each task, and (c) Identify the critical path.

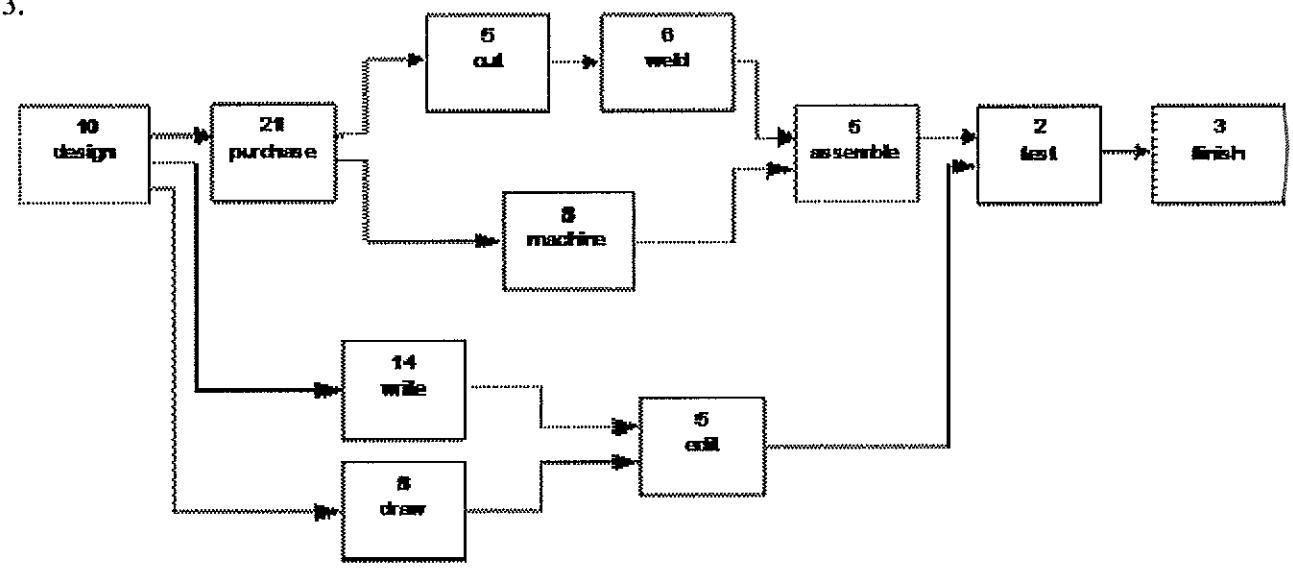
1.



2.



3.



4.3 Notes

Vocabulary:

Vertex

Edge

Connected

Complete

Degree

Adjacency Matrix

4.3 Notes continued

1. Suppose you want to schedule final exams and, being very considerate, you want to avoid having a student do more than one exam a day. We shall call the courses 1,2,3,4,5,6,7. In the table below a star in entry ij means that course i and j have at least one student in common so you can't have them on the same day. What is the least number of days you need to schedule all the exams?

.	1	2	3	4	5	6	7
1	.	*	*	*	-	*	*
2	*	.	*	-	-	-	*
3	*	*	.	*	-	-	-
4	*	-	*	.	*	*	-
5	-	-	-	*	.	*	-
6	*	-	-	*	*	.	*
7	*	*	-	-	-	*	.

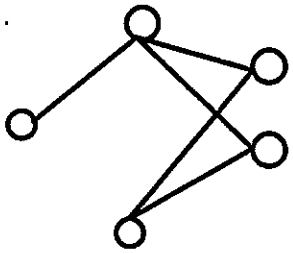
2. Suppose you run a day care for an office building and there are seven children A,B,C,D,E,F,G. You need to assign a locker where each child's parent can put the child's food. The children come and leave so they are not all there at the same time. You have 1 hour time slots starting 7:00 a.m. to 12:00 noon. A star in the table means a child is present at that time. What is the minimum number of lockers necessary?

.	A	B	C	D	E	F	G
7:00	*	-	-	*	*	-	-
8:00	*	*	*	-	-	-	-
9:00	*	-	*	*	-	*	-
10:00	*	-	*	-	-	*	*
11:00	*	-	-	-	-	*	*
12:00	*	-	-	-	*	-	-

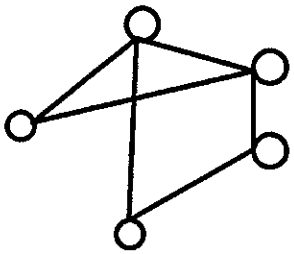
Notes – 4.6

Chromatic Number –

1.

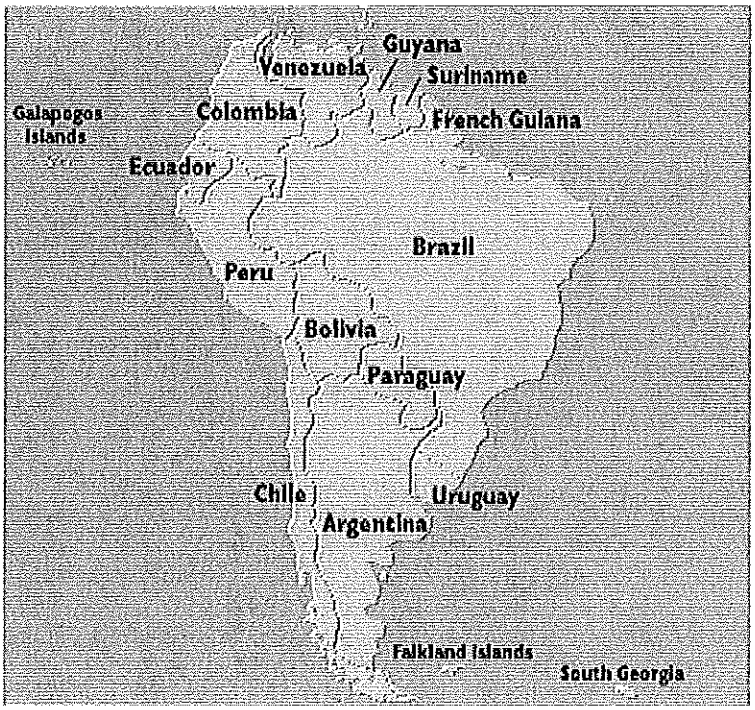


2.



3.

4.


Guyana
Venezuela
Suriname
Galapagos Islands
Colombia
French Gulana
Ecuador
Brazil
Peru
Bolivia
Paraguay
Chile
Uruguay
Argentina
Falkland Islands
South Georgia